SLU Ozone Garden Expands During Second Year

By Ben Kaldunski
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The Saint Louis University (SLU) ozone garden enjoyed its second year of successful outreach and education by showing how ozone pollution affects plant life, while expanding to two additional locations.

The project, led by SLU professor and NASA Air Quality Applied Science Team (AQAST) member Jack Fishman, expanded from one to three garden exhibits during 2013. Gardens were added at Grant's Farm (a popular tourist attraction owned by the Anheuser-Busch Corporation) and Southwestern Illinois College (SWIC) in addition to the original exhibit in Forest Park at the Saint Louis Science Center’s (SLSC) James S. McDonnell Planetarium.

Data collected in 2012 allowed the team to test plant varieties and ensure the reliability of ozone and weather monitoring equipment. In 2013, data were collected to assess ozone damage on common milkweed, cutleaf coneflower, two varieties of soybean, La Chipper potatoes and two varieties of snap beans.

The ozone sensitive and tolerant varieties of soybeans, donated by the USDA’s Agriculture Research Service, were added to the garden in 2013. Cuttings from ozone sensitive crownbeard were also transplanted from Purchase Knob in the Great Smokey Mountains National Park.

The common milkweed and cutleaf coneflower plants exhibited very little ozone induced leaf damage during 2012 at SLU and 2013 at the two new gardens. But in 2013, both species displayed extensive ozone-induced leaf stippling, chlorosis, and necrosis despite lower ozone levels. Ozone leaf damage was recorded weekly using a scale developed by the National Park Service and the progression of the damage over the season can be seen in the graphics on the right side of this page.

Snap beans and soybean pods were harvested in the fall from the SLSC and Grant’s Farm gardens; however, soybean pods from the SLSC garden were too damaged by insects to analyze. In the three samples harvested in 2013, the dried weights of the ozone sensitive species were lower than the ozone tolerant varieties indicating the effects of ground-level ozone on vegetation. The La Chipper potatoes also displayed ozone induced leaf stippling (see graph at right).

The successful expansion of the ozone garden project in 2013 will continue this year. Fishman said his team has offered assistance in starting gardens at the Franklin Institute in Philadelphia, the University of Colorado-Boulder, and an elementary school in Texas. There is also the possibility of establishing a fourth St. Louis area garden in Granite City, Illinois.

Dr. Jack Fishman is the Director of the Center for Environmental Sciences at St. Louis University and a member of AQAST, a NASA-funded team of air quality experts that strives to use advanced air quality science to develop new tools for air quality managers. Learn more about AQAST at this website. More information about the St. Louis Ozone Garden project can be found at this website.
Sources and media coverage

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These graphs illustrate the decrease in seedpod weight for two different varieties of soybean and snap beans at the Grant’s Farm and St. Louis University ozone gardens in 2013. (Image Courtesy of St. Louis University)

These graphs illustrate the increasing levels of leaf damage caused by ozone pollution on two different plant species at the St. Louis University ozone garden in 2013. (Image Courtesy of St. Louis University)